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Zusätzlich erscheint einmal im Jahr ein Heft mit den Abstracts der Vorträge, die auf der jeweiligen Hauptversammlung der Deutschen Gesellschaft für Säugetierkunde gehalten werden. Sie werden als Supplement dem betreffenden Jahrgang der Zeitschrift zugeordnet. Verantwortlich für ihren Inhalt sind ausschließlich die Autoren der Abstracts.

Manuskripte: Manuskriptsendungen sind zu richten an die Schriftleitung, z. Hd. Prof. Dr. Dieter Kruska, Institut für Haustierkunde, Biologie-Zentrum, Neue Universität, Olshausenstr. 40–60, D-2300 Kiel. Für die Publikation vorgesehene Manuskripte sollen gemäß den „Redaktionellen Richtlinien" abgefaßt werden. In ihnen finden sich weitere Hinweise zur Annahme von Manuskripten, Bedingungen für die Veröffentlichung und die Drucklegung, ferner Richtlinien für die Abfassung eines Abstracts und eine Korrekturzeichentabelle. Die Richtlinien sind auf Anfrage bei der Schriftleitung und dem Verlag erhältlich.

Sonderdrucke: Anstelle einer Unkostenvergütung erhalten die Verfasser von Originalbeiträgen und Wissenschaftlichen Kurzmitteilungen 50 unberechnete Sonderdrucke. Mehrbedarf steht gegen Berechnung zur Verfügung, jedoch muß die Bestellung spätestens mit der Rücksendung der Korrekturfahnen erfolgen.

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Reproductive reorganization in incomplete groups of the common marmoset *(Callithrix jacchus)* under laboratory conditions

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Abstract

Incomplete groups of *Callithrix jacchus* which exclusively consist of genetically related members show a rather considerable frequency of inbreeding. Therefore, the incest taboo seems to be realized at a very low level, eventually due to the laboratory environment. *C. jacchus* daughters are able to conceive in the presence of their mother. This result confirms to some extent the previous assumption upon a hierarchy dependent monogamy in the common marmoset. The reproductive reorganization of groups which have genetically unrelated members exclusively relies on these animals.

Introduction

Most authors believe marmosets to be monogamous (e.g. Rothe 1979). Bischof (1985) describes their mating and reproductive organization as 'aristogamy' since only the highest ranking group members (= parents) are allowed to interact sexually and to reproduce. Only from one species, i.e. *Saguinus fuscicollis,* we have some information from field observations that tamarins might be organized in cooperative polyandrous groups (Terborgh and Goldizen 1985).

Following the loss of one or both parent(s) monogamous groups are at first confronted with a temporary or even permanent loss of their ability to reproduce. The reproductive reorganization can be achieved by a subsequent breeding of the remaining parent with one of the adult offspring, however, undergoing by this all risks and disadvantages of inbreeding. On the other hand, reproduction can be continued by integration of a strange adult conspecific.

Reproduction of the group ceases completely if neither inbreeding nor integration of a strange conspecific occurs. The same is true if the group dissolves by emigration of single family members or even subgroups.

Up to now we do not have any detailed information on the strategy free ranging groups will follow when afflicted by the loss of one or both parents. Under laboratory conditions incomplete families as a rule cannot decide for a strategy of reproductive reorganization which includes gene flow by integration/immigration of a strange conspecific. That mode of regaining reproductive ability is only possible by interference of the investigator (Rothe et al., in press).

In this paper we confine to a description of inbreeding in the common marmoset and mechanisms of its avoidance.

Material and methods

The data were taken from the diary of our marmoset colony and from observations during the daily routine work (e.g. observations on sexual behaviour). Informations on stability/instability of the respective families exclusively refer to those contexts which led to the expulsion or removal of one or even more group members (for details see Rothe et al., in press).

We analyzed 20 *Callithrix jacchus* groups which lived at least for another two months following the loss of their mother or at least two months after the last delivery of the mother in groups, whose α-male has died. The period of two months has been determined empirically, that is, we have made the observation that groups experienced dissolution shortly after the death of the α-female or the α-male (some days up to half a month). Therefore the chance to observe sexual behaviour has been very low. Furthermore all groups we describe in this paper had adult and fertile offspring.

According to group composition we distinguish three categories: 1. groups which consisted of related members only (parents and their offspring) (n = 15). 2. groups with nonrelated members: a. by integration of hand- and/or foster mother reared infants/juveniles (n = 4); b. by integration of an adult male in an all-female group (mother and four daughters) (n = 1).

Additional informations are given on two special groups which showed different basic parameters compared to the other families, but which revealed inbreeding as well.

Results

With the exception of the special groups six families (30 %) showed further reproduction (one to three litters). In two families we at least observed sexual behaviour.

Groups with related members exclusively (n = 15)

Reproduction continued in four groups. One of these became unstable after the loss of a parent whereas this was true for 75 % of those incomplete families which have ceased reproduction (Table 1). One group experienced unstable periods following the next delivery (Table 1). Table 1 refers to the group composition as well as to the dates of the breeding females' conceptions. It is quite obvious that the unstable groups showed the longest break in reproduction. Group M is characterized by a special history (s. Table 1). The α-female has been sick for the last six months preceding her death. During that time she got rather regularly medical therapy. Already during her mother's illness an adult daughter has been impregnated by her father. The resulting delivery occurred three months following the α-female's death. Epple (1967) refers to a similar event in her *C. jacchus* colony.

Groups with genetically unrelated members (n = 5)

One group which had altogether three (2.1) integrated members (hand and foster mother reared infants) did neither show sexual nor reproductive behaviour. This group was remarkably unstable, however, we also recruted group members for pair formation. In two groups we observed copulations. Both families have been unstable periodically. After the death of the α-male copulations occurred between the α-female and one of the genetically unrelated, meanwhile adult male group members. However, we could not detect any sexual intercourse between the mother and her adult sons. In another group a young female (11 months old) which had been integrated as infant into this family became pregnant after 45 days. This female was considerably younger than an adult daughter of the α-male, with whom the male did not interact sexually. In a third group we observed copulations between an adult male which has been integrated into the family some months ago and one of the oldest females shortly after the death of the α-female. About seven months after the death of the mother the female gave birth to triplets (see also Rothe et al., in press).

Table 1. **Groups with related members exclusively**

group	loss	α-f pregnant	age of group (mo)	sex ratio	age/sex classes ad	yad	sub	iuv	inf	expulsion of GM: before loss n	before loss days	after loss n	after loss days	expulsion after birth: n	days after loss	days after birth	conception: days after loss	conception: age of female (mo)	birth n	remarks
M	α-f	--	33	6.2	m*	mf*mf	mm	m	-	-	--	-	--	2	100 174	8 82	--	20	2	conception approx. 50 days before loss of α-f
N	α-f	--	36	3.2	m*	mf*	-	-	-	-	--	-	--	-	--	--	108	26	1	father unknown, group dissolved
C	α-f	--	97.5	5.6	fm*m mff* m	ff	mf	-	-	3	112 77 43	3	2 152 164	-	--	--	187	75	3	last delivery one month before loss of α-m; at first expulsion hunter caught; two GM recruted
CF	α-m	--	--	1.1	-	m*f*	-	-	-	-	--	-	--	-	--	--	26	20	1	mf descended from special group, see text; α-f died 10 mo before; mf not yet fertile
B2	α-m/f	--	66	3.6	fmf	ffff	mm	-	-	-	--	4	8 89 107	-	--	--	--	--	-	group was divided after fighting; on day 8 two GM expelled; comp. diss.: 10 mo
F1	α-m/f	--	29	1.2	f	fm	-	-	-	2	12 6	-	--	-	--	--	--	--	-	ad f daughter from F; α-f died 7 days after loss of α-m and some GM; comp. diss.: 2.5 mo
G	α-f	--	29	4.1	m	mmf	-	-	-	-	--	2	9 48	-	--	--	--	--	-	comp. diss.: 24 mo
J	α-f	--	51	4.3	mm	mfmff	-	-	-	-	--	1	5	-	--	--	--	--	-	at first expulsion hunter caught; α-m died two mo after α-f; comp. diss.: 6 mo
M1	α-f	--	16	3.2	mm	-	mf	f	-	-	--	1	19	-	--	--	--	--	-	ad m son from M; at first expulsion hunter caught; comp. diss.: 10 mo
X	α-f	--	16	3.2	m	-	ff	-	mm	-	--	-	--	-	--	--	--	--	-	comp. diss.: 24 mo
CB	α-f	--	32.5	3.6	m	ffmf	mf	ff	-	-	--	3	3 5	-	--	--	--	--	-	on day 5 two hunters caught; one GM recruted; comp. diss.: 11,5 mo
CC	α-f	--	32.5	2.4	m	ffff	-	m	-	-	--	-	--	-	--	--	--	--	-	after 14,5 mo m and one f recruted; comp. diss.: 17 mo
CP	α-f	--	22.5	2.2	m	ff	-	m	-	1	8	-	--	-	--	--	--	--	-	comp. diss.: 11 mo
CE	α-m	x	51	8.4	fmm	mffmm mm	mf	-	-	-	--	-	--	4	123 126 170 171	122 125 169 170	--	--	1	delivery one day after loss of α-m; comp. diss.: 9,5 mo
V	α-m	x	20	3.4	f	ff	mf	mm	-	-	--	-	--	1	151	92	--	--	1	after 12 days yad ff recruted; delivery 59 days after loss; comp. diss.: 5.5 mo

mo - month(s); m - male; f - female; m - α-animal before loss; * - new α-animal; GM - group member(s); comp. diss. - complete dissolution; ad > 35 mo; yad - 35 to 15 mo; sub - 15 to 10 mo; iuv - 10 to 5 mo; inf < 5 mo; expulsions only up to approx. 170 days before/after loss/birth included (one interbirth-interval).

Table 2. **Groups with non-related members and special groups**[1]

group	loss	α-f pregnant	age of group (mo)	sex ratio	age/sex classes ad	yad	sub	iuv	inf	expulsion of GM: before loss n	expulsion of GM: before loss days	expulsion of GM: after loss n	expulsion of GM: after loss days	expulsion: after birth: n	expulsion: after birth: days after loss	expulsion: after birth: days after birth	sex behav. observed: days after loss	sex behav. observed: days after birth	conception: days after loss	conception: age of female (mo)	birth n
C1[2]	α-f	--	17	4.2	m*m	-	f	f+*m+ m+	-	3	7 4	-	--	-	--	--	--	--	45	11	2
CRxU[3]	α-f	--	6	1.4	m*	f*f	ff	-	-	-	--	1	45	1	209	3	1	--	62	18	1
R[4]	α-m	x	26	6.2	f*	mm+* m+m+f+	mm	-	-	1	23	-	--	-	--	--	210	81	--	--	1
CJ[5]	α-m	x	39	3.8	f*	ff*f m+*	mf	ff	mf	-	--	-	--	1	210	103	164	65	--	--	1
L[6]	α-f	--	19	6.4	m	mff	m+m m+m+	mf	-	-	--	-	--	-	--	--	--	--	--	--	-
F[7]	α-m	x	25.5	1.6	f*	mf	fff	f	-	1	--	-	--	1	261	56	222	17	61	60	6

mo - month(s); m - male; f - female; m - α-animal before loss; * - new α-animal or partner of sexual interaction; + - integrated hand- and/or foster mother reared iuvenile or infant; GM - group member; comp. diss. - complete dissolution; ad > 35 mo; yad - 35 to 15 mo; sub - 15 to 10 mo; iuv - 10 to 5 mo; inf < 5 mo; expulsions only up to approx. 170 days after/before loss/birth included (one interbirth-interval).

1) second special group see text and table 2 group CF;
2) ad m brother of m; after first delivery group was dissolved except α-animals;
3) m 6 mo before loss of α-f integrated, 'stepfather';
4) delivery 131 days after loss; group became unstable after approx. 190 days;
5) delivery 107 days after loss; f became ill after delivery;
6) shortly after loss 1 GM recruted; after approx. 200 days the group became very unstable; 2 hunter caught; 3 other GM recruted; comp. diss.: 14 mo
7) special group; α-male expelled; 57 days after loss abortion, not included; conception 4 days after abortion.